

treated with metaphen that the fever may rapidly return to normal. This is a definite contrast to the many weeks and months one waits to see the benefit from vaccine or acridine dye therapy.

The toxic reactions seen with the acridine dyes (also methyl violet), when administered intravenously were not encountered with metaphen in our series; however, one must not forget that metaphen is a mercurial and, like other organic or inorganic mercurial compounds, may cause kidney and liver damage. Peculiarly enough, it seemed to aid in stopping albuminuria in two of the patients in this series.

#### SUMMARY

1. Ten<sup>†</sup> cases of undulant fever treated with metaphen and one by the lysed vaccine are reported. In most of these there was a relatively prompt decline in temperature and improvement in subjective symptoms. Metaphen was administered as early as the seventh day and as late as two months after the known onset of the disease. The number of injections of 10 cc. each of metaphen ranged from two to thirteen. We believe it is probably best to repeat the injection within twelve to twenty-four hours after the first injection, and then daily for the first week and after that biweekly, if continued therapy is necessary. All patients were treated intravenously. It was obvious that the earlier the patients received the metaphen therapy, the more rapid was the decline in the temperature and symptoms.

2. Metaphen therapy compares favorably with antiserum therapy, and is more prompt in alleviating symptoms and dropping the temperature to normal than most of the reported cases in which chemotherapy or vaccine therapy has been used.

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### INDUCED JAUNDICE FOR THE CONTROL OF CHRONIC INFECTIOUS ARTHRITIS\*

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IT has long been known that patients with chronic infectious arthritis and fibrositis have experienced more or less complete relief, for varying periods of time, following an attack of intercurrent jaundice. Such cases have been reported by ourselves and others. It has been clearly apparent that if nature's method could be duplicated a great forward step in the control of arthritis would be achieved.

<sup>†</sup> Since this paper was submitted for publication, we have treated three more patients with undulant fever, including one of us (K. H. A.). In all three the diagnosis was made within the first ten days of the onset of symptoms. The fever subsided within forty-eight hours after the administration of metaphen, 10 c.c. (1:1000) intravenously. In one of us (K. H. A.) night sweats returned twice, but these were promptly stopped by repeating the metaphen. The plan of treatment used in each case was as follows: Metaphen, 10 c.c. daily, for four days (in one case five days) then every other day for three doses and, finally, once a week for two weeks. If any symptoms returned, then metaphen was given on successive days for two or three days; this was done in the one patient only (K. H. A.).

\* Presented with moving pictures at Los Angeles on July 23, 1937, to the Pasadena branch, Los Angeles County Medical Association.

Last June my associate, Doctor Thompson, and I presented to the members of the American Association for the Study and Control of Rheumatic Diseases, at Atlantic City, the first successful method for inducing a safe and nontoxic jaundice.

Our technique for the induction of jaundice was based upon a long period of study and experimental investigation. This paper, devoted to a detailed consideration of the purely scientific aspects of our research, will be off the press shortly.

#### OBSERVATIONS OF AUTHORS

Briefly, and confirming the findings of Race, we observed that serum bilirubin levels are lower in patients with chronic infectious arthritis than in normal individuals. Upon working with rabbits and administering repeated doses of bilirubin—dissolved in a sodium carbonate solution, to which was subsequently added the sodium salt of dehydrocholic acid—it was discovered that the production of jaundice resulted, and that the animals suffered no ill effects from daily injections of our compound.

After establishing the safety of our method in this manner, we felt justified in proposing the induction of jaundice to a selected group of patients who were not responding satisfactorily to conventional programs of treatment. After from one to eleven injections of our preparation, a reversal of their symptoms followed so suddenly and dramatically that the similarity between these results, and those noted in patients who had developed jaundice naturally, was most striking.

It was found that there was an analgesic serum bilirubin level, and that observable jaundice did not disappear until from two to three or more weeks following the final injection of our compound. . . .

Significance of our studies:

(a) While the mechanisms involved in the response of patients to induced jaundice are not the same as in the case of focal removals, the benefits, nevertheless, are comparable, and even superior to them in a considerable number of instances.

(b) The product and technique developed by us produce an artificial jaundice which apparently duplicates the effects reported by various observers when clinical jaundice has intervened in such patients.

(c) Since a return of the arthritic or fibrositic symptoms may follow a clinical jaundice, after varying periods of time, and in view of the fact that the duration of the benefits of artificial jaundice is seemingly subject to similar possibilities, it is desirable to prolong the effects as much as possible. This is especially important, since it is not possible to foretell how long our apparent duplication of nature's mechanisms will remain operative.

(d) The induction of artificial jaundice, therefore, should be followed up routinely by increased rest—both local and general—and the stimulation of the natural curative forces of the body by antigens and other means.

Wyatt Research Foundation.